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| 10/010,859      | 12/07/2001  | Keiichi Yagi         | 5193-03             | 7139             |

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| EXAMINER |
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MILIA, MARK R

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| ART UNIT | PAPER NUMBER |
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2622

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/010,859

Applicant(s)

YAGI, KEIICHI

Examiner

Mark R. Milia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/6/02.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed 5/6/02 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Drawings***

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Reference character (24) mentioned on page 12, lines 29-33 and reference character (38) mentioned on page 13, line 9. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: In Fig. 1, reference character (23), Fig. 6B, reference character (S138), Fig. 9B, reference character (S168), Fig. 11, reference character (S194), and Fig. 16, reference character (S214). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, 6, 8, 9, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6109722 to Underwood et al.

Regarding claim 1, Underwood discloses a recording position adjusting pattern forming method for adjusting a recording position of plural printing heads, each head having a different color, for recording a color image on a recording medium, the method comprising: assigning a first recording head of the plural recording heads as a reference recording head (see Fig. 1 and column 2 lines 43-57, reference shows that the black ink print head is used as the reference recording head), recording plural reference parallel bars on the recording medium with the reference recording head (see Fig. 2 and column 2 line 43-column 3 line 13), recording plural parallel bars on the recording medium with a second recording head of the plural recording heads, the plural parallel bars overlapping the plural reference parallel bars to form a recording position adjusting pattern (see Fig. 2 and column 2 line 58-column 3 line 13).

Regarding claim 8, Underwood discloses an image recording apparatus comprising: plural recording heads for recording images of different colors respectively on a recording medium (see Fig. 1 and column 2 lines 43-46), a recording control unit that controls a reference recording head having a reference color of the plural recording heads to record plural reference parallel bars on the recording medium, and controls a

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recording head other than the reference recording head to record plural parallel bars on the recording medium between the reference parallel bars with overlapping to thereby record a recording position adjusting pattern on the recording medium (see Fig. 2 and column 2 line 58-column 3 line 13), an optical detection unit that optically detects the recording position adjusting pattern recorded by means of the recording control unit (see column 1 lines 30-40, column 3 lines 48-56, and column 5 lines 17-20, reference shows that it is known in the art to use optical detection to adjust recording position patterns and the reference also shows that the system may use optical sensors to identify and qualify misalignments, which is analogous to the claim limitation), and a recording timing adjusting unit that adjusts a recording timing of the plural recording heads of the recording control unit based on a detected output of the optical detection unit (see column 1 lines 30-40, column 3 lines 48-56, and column 5 lines 17-20, reference states that the information gathered by the optical sensors are used to adjust the firing position or timing).

Regarding claim 4, Underwood discloses the system discussed in claim 1, and further discloses wherein the plural reference parallel bars comprise a first set of plural reference pattern blocks and the plural parallel bars comprise a second set of plural pattern blocks (see Fig. 2 and column 2 line 58-column 3 line 13).

Regarding claims 6 and 9, Underwood discloses the system discussed in claims 1 and 8, and further discloses wherein the reference recording head is a black recording head for recording a black image (see column 2 line 65-column 3 line 3).

Regarding claim 11, Underwood discloses the system discussed in claim 8, and further discloses wherein the image recording apparatus is provided with an operation starting instruction unit and an automatic execution control unit that automatically operates the recording control unit, the optical detection unit, and a recording timing adjusting unit based on an operation starting instruction supplied from the operation starting instruction unit (see column 1 lines 30-40, column 2 line 43-column 3 line 13, column 3 lines 48-56, and column 5 lines 17-20).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 13, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood in view of U.S. Patent No. 6554387 to Otsuki.

Regarding claim 12, Underwood discloses a recording position adjusting pattern forming method comprising: recording plural reference parallel bars on a recording medium by use of a first recording head of a color that is predetermined previously among independent recording heads of plural colors that are used to record a color image on the recording medium (see Fig. 2 and column 2 line 43-column 3 line 13) and using a second recording head of the independent recording heads to record plural

parallel bars between bars of the reference parallel bars (see column 2 line 43-column 3 line 13).

Underwood does not disclose expressly recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars.

Otsuki discloses recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars (see Figs. 6-8, column 8 lines 36-57, and column 9 lines 7-27, reference shows that the inclination of the (dashed) line printed on the backward pass, located between the recorded reference lines, is different than the inclination of the recorded reference lines, which is analogous to the claim limitation).

Regarding claim 13, Underwood discloses a detection method for detecting a recording position adjusting pattern comprising: recording plural reference parallel bars on a recording medium by use of a first recording head of a color that is predetermined previously among independent recording heads of plural colors that are used to record a color image on the recording medium (see Fig. 2 and column 2 line 43-column 3 line 13), using a second recording head of the independent recording heads to record plural parallel bars between bars of the reference parallel bars (see column 2 line 43-column 3 line 13), and detecting the recorded parallel bars optically (see column 5 lines 17-20).

Underwood does not disclose expressly recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars.

Otsuki discloses recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars (see Figs. 6-8, column



8 lines 36-57, and column 9 lines 7-27, reference shows that the inclination of the (dashed) line printed on the backward pass, located between the recorded reference lines, is different than the inclination of the recorded reference lines, which is analogous to the claim limitation).

Regarding claim 15, Underwood discloses an alignment method for aligning plural recording heads comprising: recording plural reference parallel bars on a recording medium by use of a first recording head of a color that is predetermined previously among independent recording heads of plural colors that are used to record a color image on the recording medium (see Fig. 2 and column 2 line 43-column 3 line 13), using a second recording head of the independent recording heads to record plural parallel bars between bars of the reference parallel bars (see column 2 line 43-column 3 line 13), detecting the recorded parallel bars optically (see column 5 lines 17-20), and adjusting a recording timing of the recording head based on the detection result (see column 3 lines 48-56).

Underwood does not disclose expressly recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars.

Otsuki discloses recording plural parallel bars with different inclination respectively between adjacent bars of the reference parallel bars (see Figs. 6-8, column 8 lines 36-57, and column 9 lines 7-27, reference shows that the inclination of the (dashed) line printed on the backward pass, located between the recorded reference lines, is different than the inclination of the recorded reference lines, which is analogous to the claim limitation).

Regarding claim 17, Underwood discloses an image recording apparatus provided with an auto-alignment mode for automatically executing an operation comprising: independent recording heads of plural colors that are used to record a color image on a recording medium (see Fig. 1 and column 2 lines 43-46), the independent recording heads including, a first recording head of a color that is predetermined previously among the independent recording heads, whereby plural reference parallel bars are recorded on a recording medium by use of the first recording head (see column 2 line 43-column 3 line 13), and a second recording head (see column 2 lines 43-46), and an optical device for detecting the recorded parallel bars optically, whereby a recording timing of the second recording head is adjusted based on a detection output signal from the optical device (see column 1 lines 30-40, column 3 lines 48-56, and column 5 lines 17-20).

Underwood does not disclose expressly whereby plural parallel bars with different inclination respectively are recorded between adjacent bars of the reference parallel bars by use of the second recording head.

Otsuki discloses whereby plural parallel bars with different inclination respectively are recorded between adjacent bars of the reference parallel bars by use of the second recording head (see Figs. 6-8, column 8 lines 36-57, and column 9 lines 7-27, reference shows that the inclination of the (dashed) line printed on the backward pass, located between the recorded reference lines, is different than the inclination of the recorded reference lines, which is analogous to the claim limitation).

Underwood & Otsuki are combinable because they are from the same field of endeavor, correction of misalignment of printer output.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the recording of plural parallel lines of inclination different than the reference parallel lines as described by Otsuki with the system of Underwood.

The suggestion/motivation for doing so would have been to ensure proper alignment of print heads during bidirectional printing and accurately determine the amount of positional misalignment (see column 1 lines 15-55 of Otsuki).

Therefore, it would have been obvious to combine Otsuki with Underwood to obtain the invention as specified in claims 12, 13, 15, and 17.

Regarding claim 16, Underwood and Otsuki disclose the system discussed in claim 15, and Underwood further discloses wherein the recording of the reference parallel bars, the recording of the plural parallel bars with different inclination, the optical detection, and the recording timing adjustment are executed automatically (see column 1 lines 30-40, column 2 line 43-column 3 line 13, column 3 lines 48-56, and column 5 lines 17-20).

Regarding claim 18, Underwood and Otsuki disclose the system discussed in claim 15, and Underwood further discloses adjusting a recording position between the plural recording heads in the horizontal direction and vertical direction with respect to a carriage moving direction, and adjusting a recording position concomitant with

reciprocation printing of carriage movement (see Figs. 1 and 2 and column 2 line 43-column 3 line 56).

6. Claims 2, 3, 5, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood as applied to claims 1 and 4 above, and further in view of Otsuki.

Regarding claim 2, Underwood does not disclose expressly adjusting an inclination of the reference parallel bars which is due to inclination of the reference recording head.

Otsuki discloses adjusting an inclination of the reference parallel bars which is due to inclination of the reference recording head (see column 8 lines 36-43).

Regarding claim 3, Underwood does not disclose expressly wherein the plural parallel bars have different inclinations respectively.

Otsuki discloses wherein the plural parallel bars have different inclinations respectively (see Figs. 6-8 and column 8 lines 44-57).

Regarding claim 5, Underwood does not disclose expressly wherein the plural parallel bars have different inclinations between blocks of the second set of plural pattern blocks (see Figs. 6-8, column 8 lines 36-57, and column 9 lines 7-27, reference shows that the inclination of the (dashed) line printed on the backward pass, located between the recorded reference lines, is different than the inclination of the recorded reference lines, which is analogous to the claim limitation).

Regarding claim 7, Underwood does not disclose expressly adjusting an inclination of the reference parallel bars which is due to inclination of the reference

recording head, adjusting a recording position in a scanning direction of a recording head between the respective recording heads of the plural recording heads, and subsequently adjusting a recording position due to inclination caused between the plural recording heads by use of the recording position adjusting pattern.

Otsuki discloses adjusting an inclination of the reference parallel bars which is due to inclination of the reference recording head, adjusting a recording position in a scanning direction of a recording head between the respective recording heads of the plural recording heads, and subsequently adjusting a recording position due to inclination caused between the plural recording heads by use of the recording position adjusting pattern (see Figs. 6-9, column 8 lines 36-57, column 9 lines 7-27, column 9 line 31-column 10 line 50).

Underwood & Otsuki are combinable because they are from the same field of endeavor, correction of misalignment of printer output.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the recording of plural parallel lines of inclination different than the reference parallel lines, especially when the inclination is due to the inclination of the reference recording head, as described by Otsuki with the system of Underwood.

The suggestion/motivation for doing so would have been to ensure proper alignment of print heads during bidirectional printing and accurately determine the amount of positional misalignment (see column 1 lines 15-55 of Otsuki).

Therefore, it would have been obvious to combine Otsuki with Underwood to obtain the invention as specified in claims 2, 3, 5, and 7.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood as applied to claim 8 above, and further in view of U.S. Patent No. 6532026 to Takahashi et al.

Underwood does not disclose expressly wherein the optical detection unit detects the recording position adjusting pattern on a downstream side of a recording direction in a direction that intersects with a scanning direction of the plural recording heads.

Takahashi discloses wherein the optical detection unit detects the recording position adjusting pattern on a downstream side of a recording direction in a direction that intersects with a scanning direction of the plural recording heads (see column 11 line 63-column 12 line 12 and column 17 lines 4-22).

Underwood & Takahashi are combinable because they are from the same field of endeavor, correction of misalignment of printer output.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the location of the optical detection sensor as described by Takahashi with the system of Underwood.

The suggestion/motivation for doing so would have been to provide the sensor with an unobstructed view of the recorded information to allow for the most accurate reading.

Therefore, it would have been obvious to combine Takahashi with Underwood to obtain the invention as specified in claim 10.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Underwood and Otsuki as applied to claim 13 above, and further in view of Takahashi.

Underwood and Otsuki do not disclose expressly wherein the optical detection involves detection of a reflected density of the parallel bars.

Takahashi discloses wherein the optical detection involves detection of a reflected density of the parallel bars (see column 20 lines 45-62).

Underwood, Otsuki, & Takahashi are combinable because they are from the same field of endeavor, correction of misalignment of printer output.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the detection of a reflected density of the parallel bars by optical detection as described by Takahashi with the system of Underwood and Otsuki.

The suggestion/motivation for doing so would have been more easily obtain if proper alignment as been attained as the amount of reflected density is compared to a reference density to yield whether the alignment of the print heads is correct.

Therefore, it would have been obvious to combine Takahashi with Underwood and Otsuki to obtain the invention as specified in claim 14.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. To further show the state of the art refer to U.S. Patent numbers

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6164745 (Nagoshi et al.), 6322191 (Seshimo et al.), 6454390 (Takahashi et al.), and 6906832 (Furukawa et al.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark R. Milia whose telephone number is (571) 272-7408. The examiner can normally be reached M-F 8:00am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached at (571) 272-7402. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark R. Milia  
Examiner  
Art Unit 2622

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